Materials Engineering Branch

TIP*

No. 092 Rolled Threads for Critical Fastener Applications

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Fasteners are purchased to numerous commercial specifications such as ASTM and ANSI as well as to various military specifications. The method for producing fastener threads is not always clearly specified, while at other times it is left to the discretion of the manufacturer.

Fastener threads are either machined or rolled. The condition of the fastener thread root region is an important factor in the determination of its tensile strength and fatigue properties. For example, when thread roots have a generous radius, the stress concentration is reduced and a substantial improvement in fastener strength is achieved.

One method of producing the desired radius in threads is by a manufacturing process called "rolling" where the threads are die formed under compressive forces. Metallurgical examination (of threads formed by the rolling process) by cross sectioning, polishing and etching shows beneficial contoured flow lines (see Figure 1).

To ensure that the fasteners that will be used for critical and special applications have the proper thread, the hardware developer should specify **rolled threads** and reference the latest version of NASM 8831-2.

NOTE: In instances where special materials are required, a machined billet can be sent to the roll-forming shop to have the threads formed.

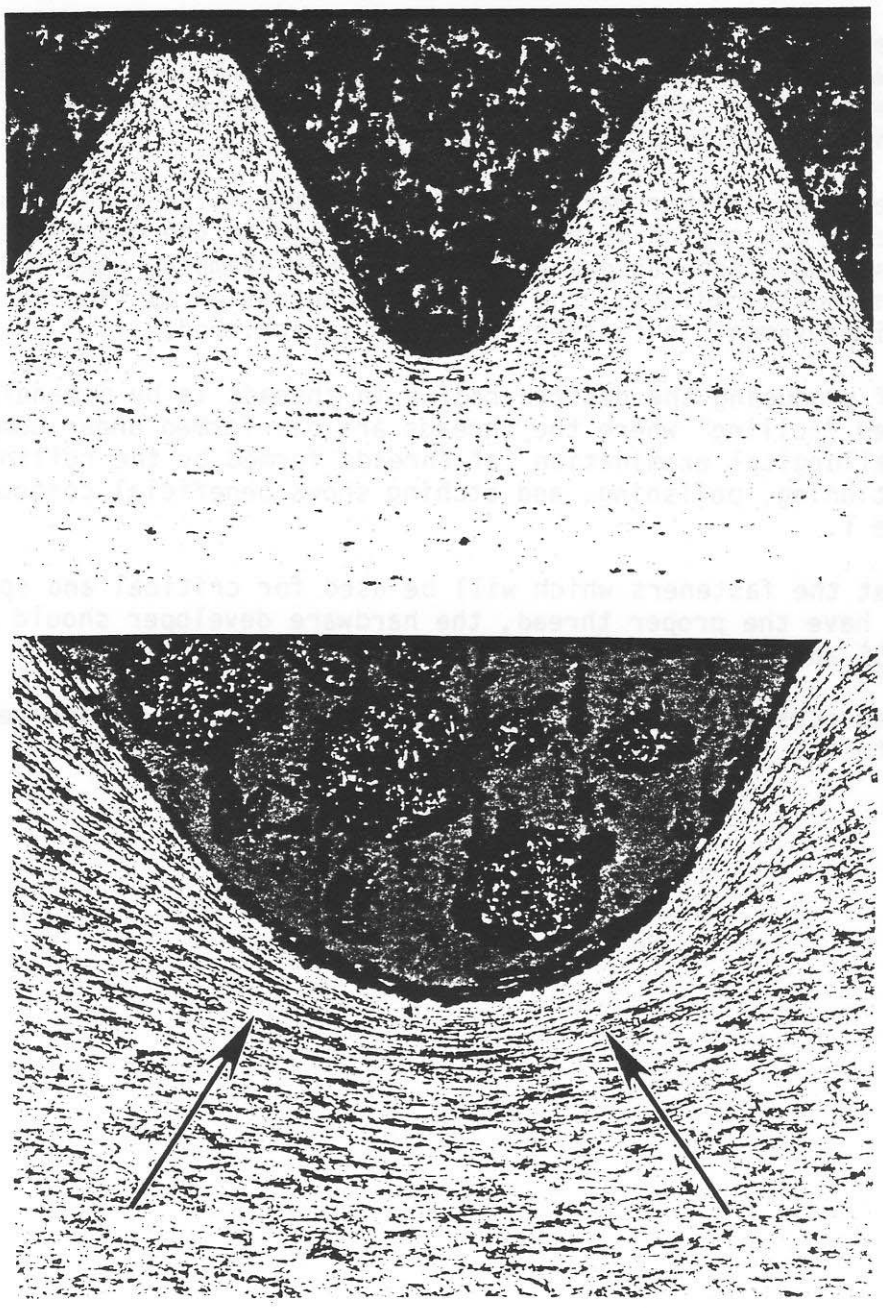

Figure 1. Rolled threads. Arrows indicate compressive zone at thread root.

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